7.0 EVALUATION OF ALTERNATIVES

The Cincinnati Streetcar project would involve the construction and operation of a modern streetcar system and a maintenance and storage facility (MSF) within a 4.9-mile study area. The two Build Alternatives (alignment alternatives) studied in this Environmental Assessment (EA) have been developed to a level of detail to enable a reasonable comparison of each alternative. For comparative purposes, a No Build Alternative was also evaluated as a baseline.

7.1 No Build Alternative

The No Build Alternative consists of minor, short-term safety and maintenance improvements to the roadway and transit network within the study area. The No Build Alternative includes existing and programmed improvements for transit and roadways in the streetcar study area. The No Build Alternative would allow for existing operations and conditions to continue in the same manner. However, a No Build Alternative would not enhance new development or introduce additional transportation options.

7.2 Build Alternatives

Build Alternatives 1 and 2 have a common alignment through Downtown Cincinnati and Over-the-Rhine (OTR), between the Freedom Way near the riverfront and Henry Street, in the northern portion of OTR. The alternatives differ in their northernmost segment connecting OTR and Uptown on either Vine Street or West Clifton Avenue. A full description of the Build Alternatives is in Section 3.2.

Build Alternatives 1 and 2 also each include three alternatives for the location of a MSF. Two of the MSF locations are located in the northern portion of OTR on Henry Street; the third is located in the southeastern portion of the Central Business District (CBD) on Broadway Street. Descriptions of the three proposed locations are listed in Section 3.3.

7.3 Design

All work would be within the existing right of way of the local roadway network. There would be no physical disruption to the existing landscape outside of the right of way.

Build Alternative 1 provides shortest travel times since it is shorter than Build Alternative 2 (3 to 6 minutes difference). Build Alternative 1 would have lower costs for the Uptown connector due to its length.

7.4 Environmental Impacts

Environmental impacts of the Build Alternatives are discussed in detail in Section 5.0. Build Alternatives 1 and 2 would have the same impacts south of Henry Street as both would follow the same alignment between Freedom Way and Henry Street. Even with the differences in the alternatives for the Uptown connector, impacts would be relatively similar. Impacts are not expected to be significant since the streetcar would be within existing right of way. The notable impacts to environmental resources are presented in the following discussions.

For traffic, the level of service (LOS) would be LOS B or better for both Build Alternatives. Approximately nine percent of existing on-street parking in the study area would be lost to accommodate streetcar stops. Impacts and mitigation of traffic would take the form of restriping, queue jumping, eliminating inside turn lanes, moving existing bus stops on the same block, and signal changes.

Impacts to neighborhoods and community facilities would be the same for both Build Alternatives. For the maintenance and storage facility locations, Location 2 would result in the displacement of the Volunteers of America halfway house. However, the facility is expected to be able to relocate within the same neighborhood.. No other displacements would occur for the mainline, streetcar stops, power substations, or other two MSF locations.

None of the alternatives would remove access to community facilities. Build Alternative 1 directly accesses Inwood Park. Build Alternative 2 directly accesses Bellevue Hill Park. Both alternatives would have a stop at Washington Park. Build Alternative 2 is more oriented to the University of Cincinnati (UC) campus while Build Alternative 1 is routed closer to the commercial areas at University Plaza. Build Alternative 2 passes a higher density of residences on Clifton Avenue than Build Alternative 1 does on Vine Street. The impact on Clifton Avenue is minimal and no different than other portions of the alignment in that it will be within the street and not impact the residences or their on-street parking.

There would be no direct loss of property taxes as a result of the trackway since work would be within existing right of way. There may be a minor loss of property taxes if one of the two privately-owned sites is used for the MSF.

Both Build Alternatives are anticipated to help facilitate economic development along the streetcar alignment. Development is expected to occur up to three blocks from the streetcar alignment as a result of the project. Build Alternative 1 is routed to the University Plaza area. Build Alternative 2 has direct access to the Clifton Heights business district. Build Alternative 1 has redevelopment potential along Vine Street. Both Build Alternatives are in mostly developed areas.

Although the majority of block groups in the study area were found to be environmental justice (EJ) population target areas, the effects associated with the proposed project are similar throughout the study area for both Build Alternatives. No individual would experience appreciably more severe or greater in magnitude impacts than those experienced by non-environmental justice communities. If MSF Location 2 is selected, the VOA halfway house will be able to relocate within the same neighborhood to minimize the impact that would come from displacement.

The Build Alternatives are not projected to measurably affect regional travel patterns, therefore no significant increase in regional emissions is anticipated. The proposed streetcar is not expected to change the vehicle mix (gasoline cars and diesel trucks) within the study area. Therefore, the project would not cause a significant increase in diesel vehicles, nor would it affect intersections operating at LOS D, E or F because of increased traffic volumes from a significant number of diesel vehicles. As such, the proposed streetcar is not considered a project of air quality concern. The proposed streetcar is not predicted to cause or exacerbate a violation of the National Ambient Air Quality Standards. The Build Alternatives are not predicted to affect the overall vehicle miles traveled within the study area, and the project is considered a

Project with No Meaningful Potential Mobile Source Air Toxics (MSAT) Effects. Therefore, no particulate matter ($PM_{2.5}$) or MSAT impacts are expected with the project.

The noise analysis findings indicate that the principal source of ambient noise along the Build Alternatives is road traffic. That would continue to be the dominant noise source in the future with or without streetcar operations. The projected noise levels associated with operation of a streetcar under both Build Alternatives would not exceed the Federal Transit Administration (FTA) criteria for a "moderate impact" or "severe impact" at any of the representative sites evaluated. The analysis findings indicate that noise generated from MSF locations is expected to be below the FTA impact threshold at the nearest noise sensitive properties adjacent to each of the three MSF locations. Noise generated from streetcar operations is not expected to cause noise impacts within the study area.

Vibration levels throughout the study area are significantly below the minimum impact threshold of 72 V dB. Based on the results of the vibration impact analysis, vibration levels would remain below the vibration impact threshold.

There is one property of potential hazardous materials concern adjacent to the Build Alternatives. However, project related excavation would not likely encounter hazardous materials associated with this site because construction excavation depth would not come close to groundwater. Since MSF Location 1 is the recommend preferred MSF location, Phase I and Phase II Environmental Site Assessments (ESA) will be performed at only this location. However, if MSF Location 2 or 3 are selected, Phase I and Phase II ESAs will be performed at that location instead.

In total, 32 resources within the APE are listed or recommended eligible for inclusion in the National Register of Historic Places (NRHP). The assessment of effects indicated that the Build Alternative and three MSF locations would not have any adverse direct or indirect effects upon historic properties. Since the project would not require the destruction, demolition, or alteration of any buildings or structures within the Area of Potential Effects (APE), potential adverse effects are limited to visual effects that might diminish the integrity of a historic property's setting, feeling, or association.

None of the three publicly-owned parks would be directly impacted or have a constructive use as a result of the streetcar project, including the MSF.

Build Alternatives 1 and 2 would not impact natural resources due to the urban landscape of the study area. The project would not impact wetlands, surface waters, or wildlife species. There is a negligible potential to change water quality or stormwater. There would be no impacts to the floodplain since the streetcar will be raised out of the floodplain. No impacts are expected to ecologically sensitive areas.

Implementing the streetcar would provide an alternative travel mode to motorists on Cincinnati's congested urban roadways. While vehicle miles travelled is not affected under the Build Alternatives, future phases of the project may potentially result in less fossil fuel consumption due to fewer motorists on the roadways and a reduction in mileage generated by motorists searching for open on-street parking. In addition, with future or expansion of the streetcar lines, the amount of fossil fuel required to generate the electricity to power the streetcar may be less than the amount of fossil fuel that would have been consumed by the motorist who converted to streetcar use. There would be a direct reduction in the consumption of fossil fuels by a modern streetcar, thus resulting in a positive impact to energy and potential for conservation.

The most visible portions of the project would be the catenary lines and poles. Construction of the catenaries would entail removal of existing overhead wires, reducing visual clutter in the study area. Due to the existing visual quality in the area, the catenary system would recede into background urban use views and would have a low potential for visual resource impacts. Build Alternative 1 is anticipated to have a lower level of visual impact than Build Alternative 2.

The proposed streetcar would be located almost entirely within the existing public right of way. It will operate in mixed traffic similar to how a bus operates, with streetcars and autos sharing lanes. The City of Cincinnati will be responsible for maintaining security on the vehicles and at stations. The project will be designed to provide good visibility to the public. Several design features will enhance safety and security, including open visibility to station stop platforms and security lighting. Cameras will be installed on streetcar vehicles. Because of this, safety and security impacts are not anticipated for either Build Alternatives 1 or 2.

7.5 Maintenance and Storage Facility

Three potential sites have been identified for the MSF:

- Location 1: South side of Henry Street (120 Henry Street)
- Location 2: North side of Henry Street (115 West McMicken Avenue)
- Location 3: Broadway between Third Street and East Pete Rose Way

The three potential MSF locations were analyzed for impacts. Table 36 is a summary matrix comparing the sites.

A facility would change the existing land use at all three locations; however this facility would be a compatible land use at any of the three sites since they are currently industrial or parking.

Locations 1 and 2 would require the acquisition of private property. Location 1 has a higher property value than Location 2. Location 2 would displace the Volunteers of America halfway house that currently leases the facility. This service would be able to relocate in OTR. Locations 1 and 3 would not require relocations. Location 3 is owned by the City of Cincinnati, so property acquisition would not be required. All three locations would have some level of impact on traffic operations. Locations 1 and 2 would require the conversion of Henry Street from two-way to one-way; however, traffic volumes on Henry Street are low and only minor inconvenience would result. Location 3 would require a dedicated lane for the streetcar and new traffic signals on the adjacent block of Broadway. All three locations are recommended for Phase I and II Environmental Site Assessments.

Table 36. Comparison of Maintenance and Storage Facility Locations

Criteria	Location 1: 120 Henry Street	Location 2: 115 W. McMicken Avenue	Location 3: Broadway & 3rd Street
Location on Phase 1 Loop	Yes: Central to Phase 1 loop and Uptown Connector	Yes: Central to Phase 1 loop and Uptown Connector	No : May be incorporated with East End or Newport, Kentucky expansion

Table 36. Comparison of Maintenance and Storage Facility Locations

Criteria	Location 1: 120 Henry Street	Location 2: 115 W. McMicken Avenue	Location 3: Broadway & 3rd Street
Non-Revenue Track Required	2 Turn-outs	2 Turn-outs	3000 feet of track ($5.5 million at $1850/foot 4 Turn-outs
Lot Area	36,000 square foot (SF) (Rectangular Shape)	27,000 SF (Rectangular Shape)	54,000 SF (Irregular Shape) Area broken up by bridge piers
Demolition Required	Yes: 30,000 SF with basement	Yes: 21,000 SF building without basement	No: Excavation and large retaining walls and fill on south side of lot required to level site
On-site Parking	No	Possibly on McMicken Avenue	Yes
Adjacent Parking	Yes	Yes	Yes
Site Preparation Required	Foundation removal and basement fill. Existing foundations and basement area may be reused for service pits and building	Retaining wall at north end	Retaining walls on two sides; Modifications to pier footings
Bridge Modifications	None required	None required	Structural modification to Main Street structural deck to accommodate switch equipment. Ramp LL bridge provides blockout in deck for future light rail in the south curb lane only.
Vehicle Storage Capacity	12	9	9
Overhead Clearance Conflicts	No	No	Possible conflicts with Fort Washington Way bridge beams and pier caps. Bridge footings are below proposed site grade (minimal conflicts)
Traffic Modifications	Convert Henry Street to one-way (East)	Convert Henry Street to one-way (East)	Provide dedicated streetcar center lane on Broadway. Four signaled left turns required (Ramp LL to Pete Rose Way, Pete Rose Way to Broadway, Broadway to maintenance facility, Broadway to 3rd Street).

Table 36. Comparison of Maintenance and Storage Facility Locations

Criteria	Location 1: 120 Henry Street	Location 2: 115 W. McMicken Avenue	Location 3: Broadway & 3rd Street
Accommodate Substation	Yes this site will have enough room to place a 20 x 40 foot substation that transforms and inverts the power from Duke Power's 480v AC/3 phase to 750v DC single phase.	Possibly	Yes this site will have enough room to place a 20 x 40 foot substation that transforms and inverts the power from Duke Power's 480v AC/3 phase to 750v DC single phase.
Existing Underground Utilities	Existing sanitary bisects site	No	Yes: Utilities under former Broadway near Maintenance Building
Property Acquisition Required	Yes: Nineteen Ten Elm Street, LLC current owner	Yes: VOA/ORV Property Company, Inc. current owner	No: Requires modification to existing City/County agreement
Current Zoning Classification	Urban Mix District	Urban Mix District	Downtown Development
Historic District	Yes	Yes	No
Existing Historic Structure	No	No	No
Cultural Resources	Yes: Within OTRHistoric District	Yes: Within OTR Historic District	No
Air Quality and Noise	Noise levels do not reach FTA minimum impact threshold	Noise levels do not reach FTA minimum impact threshold	Noise levels do not reach FTA minimum impact threshold
Floodplain	No	No	Flood plain encroachment: Access on south side is within floodplain. The site would be raised out of floodplain. Conditional Letter of Map Revision (CLOMR-F) required by the Federal Emergency Management Agency (FEMA) and Section 404 permit will be required from US Army Corps of Engineers
Community Impacts	Minimal: Future use consistent with current use of site (light manufacturing)	Yes: Displacement; Community impacts may arise from relocation of existing community service organization (Volunteers of America halfway house) currently leasing the facility	No

Table 36. Comparison of Maintenance and Storage Facility Locations

Criteria	Location 1: 120 Henry Street	Location 2: 115 W. McMicken Avenue	Location 3: Broadway & 3rd Street
Hazardous Materials	Phase I and II ESAs required	Phase I and II ESAs required	Phase I and II ESAs required if not covered under Fort Washington Way project

8.0 RECOMMENDATIONS

The overall long-range transportation goal of the modern streetcar is to provide a safe, efficient, economical, attractive, and integrated transit connection that contributes to increased economic development within the central business district and contributes to reduced reliance on auto travel and reduced auto parking requirements.

The following are the needs and opportunities for the proposed action:

- Connect major activity centers
- Create economic development opportunities
- Support population and employment growth
- Improve transit service options
- Consistency with local plans

Both Build Alternatives 1 and 2 meet the purpose and need for the Cincinnati Streetcar project. The No Build Alternative allows for transportation operations to continue in an existing manner, but would not meet the purpose and need of the project. Since work will be with existing right of way, neither Build Alternative is expected to have substantial environmental impacts.

Based on a comparative analysis of the Build Alternatives, specifically connections to Uptown, Alternative 1 is recommended as the preferred alternative. The primary factors in this recommendation are the travel times, grades of Vine Street and West Clifton Avenue and the estimated costs. West Clifton Avenue has a steeper grade than Vine Street, 8.6 and 7.0 percent, respectively. Build Alternative 1 provides shortest travel times since it is shorter than Build Alternative 2 (3 to 6 minute difference). Build Alternative 1 would have lower costs for the Uptown Connector due to its length. Therefore, Alternative 1 is the recommended preferred alternative for the Cincinnati Streetcar project. Build Alternative 2 is recommended to be eliminated from further consideration.

Based on a comparative analysis of the three maintenance and storage facility (MSF) sites, Location 1 on the south side of Henry Street at 120 Henry Street is recommended as the preferred MSF site. This 36,000-square foot rectangular shaped site is located in Over-the-Rhine (OTR) in an area zoned as an Urban Mix district. It is currently owned by Nineteen Ten Elm Street, LLC and there is a vacant 30,000-square foot industrial building with basement located on this site. The size and shape of the site would provide storage for 12 streetcars.